

CLAIMS

What is claimed is:

1. A waveguide produced by:
 - depositing a first metal layer on a substrate;
 - depositing a sacrificial material on the first metal layer;
 - 5 depositing a second metal layer on the sacrificial material, the second metal layer contacting the first metal layer and defining therebetween a cavity for the waveguide, the cavity filled with the sacrificial material; and
 - removing the sacrificial material.
2. The waveguide of claim 1, wherein removing the sacrificial material comprises thermally decomposing the sacrificial material.
3. The waveguide of claim 1, wherein the sacrificial material comprises polynorbornene.
4. The waveguide of claim 1, wherein removing the sacrificial material comprises etching the sacrificial material.
5. The waveguide of claim 1, wherein removing the sacrificial material comprises dissolving the sacrificial material.

6. The waveguide of claim 1, wherein the first and second metal layers comprise gold.
7. A method comprising:
- depositing a first metal layer on a substrate;
 - depositing a sacrificial material on the first metal layer;
 - depositing a second metal layer on the sacrificial material, the second
- 5 metal layer contacting the first metal layer and defining therebetween a cavity for a waveguide, the cavity filled with the sacrificial material; and
- removing the sacrificial material to produce a waveguide.
8. The method of claim 7, wherein removing the sacrificial material comprises thermally decomposing the sacrificial material.
9. The method of claim 7, wherein removing the sacrificial material comprises etching the sacrificial material.
10. The method of claim 7, wherein removing the sacrificial material comprises dissolving the sacrificial material.
11. The waveguide of claim 1, further comprising before depositing the sacrificial material, plating the first metal layer.
12. The method of claim 7, further comprising before depositing the second metal layer, patterning the sacrificial material by:

- 5 depositing a mask layer on the sacrificial material;
 depositing photoresist material on the mask layer;
 etching at least a portion of the mask layer;
 removing the photoresist material;
 reactive ion etching the sacrificial material not layered by the mask
layer; and
 removing the mask layer.

13. The method of claim 12, wherein depositing photoresist material comprises spin coating the photoresist material, and patterning the photoresist material to a desired width of the waveguide.

14. The method of claim 7, further comprising after depositing the second metal layer, patterning the second metal layer to a desired width of the waveguide.

15. The method of claim 14, wherein patterning comprises:
 depositing a photoresist material;
 patterning the photoresist material to the desired width of the
waveguide;
5 etching the metal; and
 removing the photoresist material.

16. The method of claim 7, wherein the sacrificial material comprises polynorbornene.

17. The method of claim 7, wherein the first and second layers comprise gold.

18. The method of claim 7, wherein depositing a first metal layer comprises sputtering the first metal layer.

19. The method of claim 7, wherein depositing a first metal layer comprises laminating the first metal layer.

20. The method of claim 7, wherein depositing a sacrificial material comprises spin coating the sacrificial material.